

## **REMARKS**

In the Office Action, claims 1-52 and 54-57 were pending. Claims 40-52 were withdrawn from consideration. Claims 1-39 and 54-57 were rejected.

Claims 1, 15, 19, 36-39 and 54-57 have been amended. The proposed amendments do not contain new matter. The subject matter of the amendments can be found at paragraphs [0034] and [0036] of the originally filed specification and in the originally filed claims, among other places. Applicants respectfully request admission of amended claims 1, 15, 36-38 and 54-57.

### **I. Claim Rejection under 35 U.S.C. § 102**

In the Office Action at page 2, number 3, claims 1-13 and 17-30 were rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent No. 6,103,363 ("Boire"). Applicants respectfully traverse the rejection.

#### **A. The Present Invention**

The present invention as recited in amended claim 1 is an article, comprising: a substrate having at least one surface; and a photo-induced hydrophilic coating deposited over at least a portion of the at least one surface, wherein an outer surface of the photo-induced hydrophilic coating has a root mean square roughness of less than 1 nm; and wherein the photo-induced hydrophilic coating is deposited by a process selected from chemical vapor deposition, magnetron sputtered vacuum deposition, and spray pyrolysis.

#### **B. Boire**

The Boire reference discloses a coated substrate. The coating has photocatalytic properties and comprises titanium oxide at least partly crystallized in the anatase form. Boire teaches and discloses titanium oxide based coatings that exhibit a roughness of approximately 2 to 20 nm.

#### **C. Traversal of the Rejection**

To anticipate a claim, a single source must contain all of the elements of the claim. See Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1379, 231 U.S.P.Q. 81, 90 (Fed. Cir. 1986).

The invention as recited in amended claim 1 is an article with a photo-induced hydrophilic coating deposited on the article. The outer surface of the

photo-induced hydrophilic coating has a root mean square roughness of less than 1 nm.

In contrast to the present invention, Boire discloses titanium based coatings that exhibit a surface roughness of approximately 2 to 20 nm. Because the word "approximately" modifies the specified range, Boire discloses a roughness that is less than 2. However, "approximately" does not extend the range from 2 nm to 1 nm. In the Office Action, the Examiner even stated as much. At page 6 of the Office Action, the Examiner stated Boire does not disclose that the surface roughness is below 1 nm. Claim 1 has been amended to specifically recite a surface roughness of less than 1 nm.

Because Boire does not disclose the root mean square surface roughness of the photo-induced hydrophilic coating as recited in claim 1, it does not disclose each and every element of the present invention and cannot anticipate the recited article. As a result, Applicants respectfully request the withdrawal of the rejection of claim 1 under 35 U.S.C. § 102(a).

Claims 2-13 and 17-30 directly or indirectly depend on claim 1 and recite the present invention in varying scope. Applicants have discussed above how amended claim 1 is not anticipated by Boire and there is nothing in Boire that teaches or discloses the invention as recited in claim 1, as further limited by claims 2-13 and 17-30. As a result, claims 2-13 and 17-30 are not anticipated by the reference of record. Applicants respectfully request the withdrawal of the rejection of claims 2-13 and 17-30 under 35 U.S.C. § 102(a).

## **II. Claim Rejection under 35 U.S.C. § 103**

In the Office Action at page 5, number 6, claims 1-39 and 54-57 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Boire. Applicants respectfully traverse the rejection.

### **A. The Present Invention**

The present invention as recited in amended claim 1 is an article, comprising: a substrate having at least one surface; and a photo-induced hydrophilic coating deposited over at least a portion of the at least one surface, wherein an outer surface of the photo-induced hydrophilic coating has a root mean square roughness of less than 1 nm; and wherein the photo-induced hydrophilic coating is deposited by a process selected from chemical

vapor deposition, magnetron sputtered vacuum deposition, and spray pyrolysis.

The present invention as recited in amended claim 36 is an article, comprising: a float glass ribbon having at least one surface; and a photo-induced hydrophilic coating deposited directly on at least a portion of the at least one surface, wherein the photo-induced hydrophilic coating is deposited directly on the float glass ribbon in a molten metal bath and the outer surface of the photo-induced hydrophilic coating has a root mean square roughness of less than 1 nm.

The present invention as recited in amended claim 37 is an article, comprising: a substrate having at least one surface; and a photo-induced hydrophilic coating deposited over at least a portion of the at least one surface, wherein the photo-induced hydrophilic coating has a photocatalytic activity of less than or equal to  $3 \times 10^{-3} \text{ cm}^{-1} \text{ min}^{-1}$  and the outer surface of the photo-induced hydrophilic coating is substantially non-porous and has a root mean square roughness of less than 1 nm.

The present invention as recited in amended claim 38 is an article, comprising: a substrate having at least one surface; a photo-induced hydrophilic coating deposited over at least a portion of the at least one surface, wherein the substrate is a float glass ribbon located in a molten metal bath, wherein the photo-induced hydrophilic coating has a thickness of 500 Å or less, and wherein the photo-induced hydrophilic coating is deposited over the at least one surface in a molten metal bath by chemical vapor deposition and the outer surface of the photo-induced hydrophilic coating is substantially non-porous and has a root mean square roughness of less than 1 nm.

The present invention as recited in amended claim 39 is an article, comprising: a substrate having at least one surface; and a photo-induced hydrophilic coating deposited over at least a portion of the at least one surface, wherein the photo-induced hydrophilic coating is deposited by chemical vapor deposition at a temperature in the range of 500°C to 1200°C, and wherein the photo-induced hydrophilic coating has a thickness of 500 Å or less and the outer surface of the photo-induced hydrophilic coating has a root mean square roughness of less than 1 nm.

## **B. Traversal of the Rejection**

To establish a prima facie case, the PTO must satisfy three requirements. First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references. See In re Fine, 837 F.2d 1071, 1074, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). Second, the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. See Amgen Inc. v. Chugai Pharm Co., 927 F. 2d 1200, 1209, 18 U.S.P.Q.2d 1016, 1023 (Fed. Cir. 1991). Lastly, the prior art reference or combination of references must teach or suggest all the limitations of the claims. See In re Wilson, 424 F.2d 1382, 1385, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970).

The invention as recited in amended claim 1 is an article with a photo-induced hydrophilic coating deposited on the article. The outer surface of the photo-induced hydrophilic coating has a root mean square roughness of less than 1 nm.

In contrast to the present invention, Boire teaches titanium based coatings that exhibit a roughness of approximately 2 to 20 nm. As discussed above, Examiner has stated that the range recited in Boire does not cover a coating with a roughness of less than 1 nm, as recited in claim 1.

As a result, amended claim 1 is patentably distinguishable over the reference of record. Applicants respectfully request the withdrawal of the rejection of claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Boire.

Claims 2-35 directly or indirectly depend on claim 1 and recite the present invention in varying scope. Applicants have discussed above how amended claim 1 is patentably distinguishable Boire and there is nothing in Boire that teaches or discloses the invention as recited in claim 1, as further limited by claims 2-35. As a result, claims 2-35 are patentably distinguishable over the reference of record. Applicants respectfully request the withdrawal of the rejection of claims 2-35 under 35 U.S.C. § 103(a).

The invention as recited in amended claim 36 is an article with a photo-induced hydrophilic coating deposited on the article. The outer surface of the photo-induced hydrophilic coating has a root mean square roughness of less than 1 nm. The photo-induced hydrophilic coating is deposited directly on a float glass ribbon in a molten metal bath.

In contrast to the present invention, Boire teaches titanium based coatings that exhibit a roughness of approximately 2 to 20 nm. As discussed above, the range of surface roughness taught by Boire does not cover a surface roughness of less than 1 nm.

Because Boire does not teach a photo-induced hydrophilic coating deposited directly on a float glass ribbon in a molten metal bath that has a root mean square roughness of less than 1 nm, amended claim 36 is patentably distinguishable over the reference of record. Applicants respectfully request the withdrawal of the rejection of claim 36 under 35 U.S.C. § 103(a) as being unpatentable over Boire.

The invention as recited in amended claim 37 is an article with a photo-induced hydrophilic coating deposited on the article. The outer surface of the photo-induced hydrophilic coating is substantially non-porous and has a root mean square roughness of less than 1 nm.

In contrast to the present invention, Boire teaches titanium based coatings that exhibit a roughness of approximately 2 to 20 nm. Also, Boire teaches that it is advantageous to promote a degree of porosity in the thickness of the coating. See Boire at col. 4, lines 64-67. At page 6 of the Office Action, the Examiner stated that Boire does not disclose that the surface roughness is below 1 nm and that the coating is substantially non-porous.

Because Boire does not teach a photo-induced hydrophilic coating that is substantially non-porous and has a root mean square roughness of less than 1, amended claim 37 is patentably distinguishable over the reference of record. Applicants respectfully request the withdrawal of the rejection of claim 37 under 35 U.S.C. § 103(a) as being unpatentable over Boire.

The invention as recited in amended claim 38 is an article with a photo-induced hydrophilic coating deposited on the article. The outer surface of the photo-induced hydrophilic coating is substantially non-porous and has a root

mean square roughness of less than 1 nm. Also, the photo-induced hydrophilic coating is deposited in a molten metal bath by chemical vapor deposition.

For the reasons stated above in reference to amended claim 37, Boire does not teach a photo-induced hydrophilic coating that is substantially non-porous and has a root mean square roughness of less than 1nm. As a result, amended claim 38 is patentably distinguishable over the reference of record, and Applicants respectfully request the withdrawal of the rejection of claim 38 under 35 U.S.C. § 103(a) as being unpatentable over Boire.

The invention as recited in amended claim 39 is an article with a photo-induced hydrophilic coating deposited on the article. The outer surface of the photo-induced hydrophilic coating has a root mean square roughness of less than 1 nm. The photo-induced hydrophilic coating is deposited by chemical vapor deposition at a temperature in the range of 500°C to 1200°C.

For reasons similar to those stated above in reference to amended claim 36, Boire does not teach a photo-induced hydrophilic coating that is substantially non-porous and has a root mean square roughness of less than 1 nm. Further, Boire does not teach such coating deposited by chemical vapor deposition at a temperature in the range of 500°C to 1200°C. As a result, amended claim 39 is patentably distinguishable over the reference of record, and Applicants respectfully request the withdrawal of the rejection of claim 39 under 35 U.S.C. § 103(a) as being unpatentable over Boire.

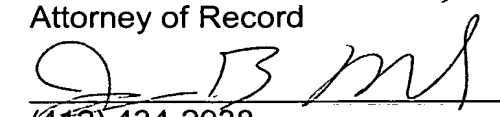
### **III. Conclusion**

In light of the amendments and remarks presented in this correspondence, Applicants respectfully request the withdrawal of: the rejection of claims 1-13 and 17-30 under 35 U.S.C. § 102(a) as being anticipated by Boire; the rejection of claims 1-39 and 54-57 under 35 U.S.C. § 103(a) as being unpatentable over Boire; the rejection of claims 1-39 and 54-57 under 35 U.S.C. § 103(a) as being unpatentable over Boire; and allowance of claims 1-39 and 54-57.

If any questions remain about this application, the Examiner is requested to contact Applicants' attorney at the telephone number provided below. Thank you.

Respectfully submitted,

JACQUES B. MILES  
Registration No. 42,888  
Attorney of Record

  
(412) 434-2938

Pittsburgh, Pennsylvania  
April 6, 2005